<News> A Survey of the Savanna Vegetation in Bossou, Guinea

AUTHOR(S):

Morimura, Naruki; Ohashi, Gaku; Matsuzawa, Tetsuro

CITATION:

Morimura, Naruki ...[et al]. <News> A Survey of the Savanna Vegetation in Bossou, Guinea. Pan Africa News 2014, 21(2): 22-24

ISSUE DATE:

2014-12

URL:

http://hdl.handle.net/2433/192911

substantial difference in chimpanzee responses when they encounter conspecific or non-conspecific dead bodies. They show emotions by emitting "wraa" calls or "huu" calls. They approach, watch, sniff, and touch the carcass for inspection, while they are ready to run away from the carcass with a slight stimulus or none. It seems plausible that these behaviors reflect "general curiosity" in wild chimpanzees. Unusual or unfamiliar objects often motivate an animal's explorative behavior, since it may be adaptive in learning of risks and dangers. Fear arises at the same time and motivates the animal's retreat because the explored objects may be risky or dangerous to it.

However, two differences may be noticed in chimpanzees' responses when they encounter the carcasses of either familiar conspecific or non-conspecific mammals. First, chimpanzees did not show as much curiosity about the putrid non-conspecific carcass (this study) as they showed about a putrid conspecific carcass (Hosaka *et al*. 2000). The identity of the carcass and the long-term relationships with the dead individual may have affected their responses to a certain degree. Second, chimpanzees showed more curiosity about the fresh non-conspecific carcass (this study) than they showed about the fresh carcass of a conspecific animal that died from a respiratory disease (Hosaka *et al*. 2000). Cause of death may have motivated different responses. If chimpanzees find a carcass freshly killed by a leopard, this may motivate them to be alert and to explore it for more information about the predator.

Finally, this study provided valuable information as to the stenophagous nature of chimpanzee meat-eating habits. Ihobe (1993) insisted that chimpanzees are stenophagous meat-eaters in contrast to humans, who have evolved as euryphagous meat-eaters after acquiring a "prey image" for any type of mammal meat and beginning to rely on a "scavenging life" in savannah (Speth 1989).

It is likely that chimpanzees did not eat the fresh aardvark carcass simply because they had no prey image for this nocturnal mammal that they would not normally encounter during their ranging in the daytime. It seems easier for chimpanzees to develop a prey image for diurnal mammals (*e.g.* arboreal monkeys), with which they have a high encounter rate (Uehara 1997; Hosaka *et al*. 2001).

ACKNOWLEDGMENTS

The fieldwork for this study was supported by a JSPS Grant-in-Aid for Scientific Research (A) (1) (#16255007 to Toshisada Nishida). Analysis of the data from videos and field notes was supported by a MEXT Grant-in-Aid for Young Scientists (B) (#15770159 to Kazuhiko Hosaka). We are indebted to the Tanzania Commission for Science and Technology (COSTECH), the Tanzania Wildlife Research Institute (TAWIRI), and the Tanzania National Parks (TANAPA) for permission to undertake research on chimpanzees in the Mahale Mountains National Park. We also thank all the local assistants for their cooperation in the daily tracking of chimpanzees.

REFERENCES

Bailey TN 1990. *The African Leopard*. Columbia University Press, New York.

Boesch C 1991. The effect of leopard predation on grouping patterns in forest chimpanzees. *Behaviour* **117**:220–242.

Boesch C, Boesch H 1989. Hunting behavior of wild chimpanzees in the Taï National Park. *Am J Phys Anthropol* **78**:547–573.

Goodall J 1986. *The Chimpanzees of Gombe: Patterns of Behavior*. Belknap, Cambridge, MA.

Hasegawa T, Hiraiwa M, Nishida T, Takasaki H 1983. New evidence on scavenging behavior in wild chimpanzees. *Curr Anthropol* **24**:231–232.

Hiraiwa-Hasegawa M, Byrne RW, Takasaki H, Byrne JM 1986. Aggression toward large carnivores by wild chimpanzees of Mahale Mountains National Park, Tanzania. *Folia Primatol* **47**:8–13.

Hirata S, Yamakoshi G, Fujita S, Ohashi G, Matsuzawa M 2001. Capturing and toying with hyraxes (*Dendrohyrax dorsalis*) by wild chimpanzees (*Pan troglodytes*) at Bossou, Guinea. *Am J Primatol* **53**:93–97.

Hosaka K, Matsumoto-Oda A, Huffman MA, Kawanaka K 2000. Reactions to dead bodies of conspecifics by wild chimpanzees in the Mahale Mountains, Tanzania. *Primate Res* **16**:1–15, in Japanese with English summary.

Hosaka K, Nishida T, Hamai M, Matsumoto-Oda A, Uehara S 2001. Predation of mammals by the chimpanzees of the Mahale Mountains, Tanzania. In: *All Apes Great and Small, vol. 1: African Apes*. Galdikas BMF, Nancy Briggs E, Sheeran L, Shapiro G, Goodall J (eds), Kluwer Academic, New York, pp. 107–130.

Ihobe H 1993. Meat and beast: Prey images of bononos, chimpanzees, and humans. *J Afr Stud* **42**:61–68, in Japanese.

Lindsey P, Cilliers S, Griffin M, Taylor A, Lehmann T, Rathbun G (IUCN SSC Afrotheria Specialist Group) 2008. *Orycteropus afer. The IUCN Red List of Threatened Species. Version 2014.3*. <www.iucnredlist.org>. Downloaded on 24 December 2014.

Moyer DC 2006. *Biodiversity of Mahale Mountains National Park, Tanzania*. Wildlife Conservation Society, New York.

Speth JD 1989. Early hominid hunting and scavenging: the role of meat as an energy source. *J Hum Evol* **18**:329–343.

Teleki G 1973. Group response to the accidental death of a chimpanzee in Gombe National Park, Tanzania. *Folia Primatol* **20**:81–94.

Tsukahara T 1993. Lions eat chimpanzees: the first evidence of predation by lions on wild chimpanzees. *Am J Primatol* **29**:1–11.

Uehara 1997. Predation on mammals by the chimpanzee (*Pan troglodytes*). *Primates* **38**:193–214.

Watts DP 2008. Scavenging by chimpanzees at Ngogo and the relevance of chimpanzee scavenging to early hominin behavioral ecology. *J Hum Evol* **54**:125–133.

<NEWS>
A survey of the savanna vegetation in Bossou, Guinea

Naruki Morimura[1], Gaku Ohashi[2] & Tetsuro Matsuzawa[3]

1 *Wildlife Research Center, Kyoto University, Japan*
2 *Japan Monkey Centre, Japan*
3 *Primate Research Institute, Kyoto University, Japan*
(*E-mail: morimura.naruki.5a@kyoto-u.ac.jp)*

At Bossou, located 4 km west of the Nimba Mountains representing the only World Natural Heritage site (UNESCO/MAB) in Guinea, a group of chimpanzees has been studied for the past 39 years (Matsuzawa *et al*. 2011). The Bossou chimpanzees, which currently number nine individuals, have coexisted over many generations with the local Manon people in the village. Due to the lack of female immigration since the beginning of

the field study and a flu-like epidemic (Matsuzawa *et al.* 2004) that occurred in November 2003, this isolated local population is in ongoing danger of extinction. The Green Corridor project (Hirata *et al.* 1998), a tree plantation effort in the savanna, was started in 1997 to promote individual interchanges between the wild chimpanzee groups at Bossou and the Nimba Mountains. We developed the arbor procedure (Ohashi *et al.* 2008) at a sapling nursery in the savanna using chimpanzee feces after struggling to protect fragile saplings in the savanna with HEXATUBEs (Phytoculture Control Co., Ltd.). The arbor procedure provides saplings with similar conditions to those of the nursery after transplantation to the savanna. We had constructed 47 arbors for plantings by 2012.

The arbor procedure is well suited for promoting plant growth in the savanna to greater than 4 m in height. In brief, the procedure involves the following steps: (1) growing *Uapaca heudelotii* saplings in chimpanzee feces (Matsuzawa 2007), (2) planting the saplings under arbors in the savanna during the rainy season, and (3) cutting the grass in the area surrounding the grown saplings to protect them from bush fires, especially during the dry season. Theoretically, regular use of the arbor procedure will construct a plantation corridor connecting the forests of Bossou and the Nimba Mountains. Currently, we must refine a strategy for connecting each arbor to create this tree plantation corridor. The trees grown in a plantation can provide similar condition as the arbor by shadowing over the new natural and/or artificial saplings that surround rotten arbors during strong sunshine. Expanded grass cutting is expected to maintain these saplings by facilitating sapling growth in the rainy season and increasing the resistance of the plantation to bush fires in the dry season (Morimura *et al.* 2011). We place plantation arbors only where necessary, in places where saplings cannot grow naturally. The combination of arbor sapling plantation and grass cutting may allow us to extend the plantation area into a belt over 1 km in length while controlling the labor force and financial costs. We began cutting the grass between the plantation points at current and former arbors to create plantation strip areas in January 2014.

It is unclear, however, what plant species can grow naturally in the savanna around Bossou, which is dominated by elephant grass. Moreover, no information is available on whether grass cutting facilitates the growth of small natural saplings that are under the bush. Therefore, we conducted vegetation surveys at two transects soon after grass cutting between July and August 2014. In the first transect (#1), the grass had been cut in January 2014. The elephant grass had subsequently grown up and dominated the area again by the time of the survey. In the second transect (#2), the grass had been cut for the first time at the time of the present survey. The lengths of transects 1 and 2 were 581 m (from 7°38'2.16"N/8°28'51.12"W to 7°38'12.87"N/8°29'4.42"W) and 524 m (from 7°37'59.8"N/8°28'51.54"W to 7°38'11.39"N/8°29'6.54"W), respectively, and the width of each was approximately 10 m. NM and local assistants identified the scientific names of all natural tree species below a height of 2 m and measured their heights (Figure 1).

Figure 1. A local collaborator measuring a sapling.

We counted 127 and 120 natural plants in transects

Table 1. Natural plants in each height category in transects 1 and 2.

	Transect 1				Transect 2				Plant consumption by
Scientific name	50>	50–100	100–150	150–200	50>	50–100	100–150	150–200	Bossou chimpanzees
Albizia adianthifolia	2		3			1	1	1	YES
Albizia zygia		1	1			2	4	9	YES
Alchornea cordifolia						1			YES
Anthocleista djalonensis						1	2		
Bridelia ferrunginea			2	2			4	3	YES
Chlorophora excelsa								1	YES
Craterispermum caudatum					1				
Dychrostakys glomerata	2	20	3				3	4	
Ficus sur		1	1	1				1	YES
Funtumia elastica							1		YES
Glbertiodendron bilineatum						1			
Harungana madagascariensis	22	15	14	1		6	8	7	YES
Morinda germinata		2	1						
Mytragyna stypilosa						1		1	
Nauclea latifolia	3	5	13	8	7	9	16	15	YES
Phyllanthus discoideus						2	2		YES
Vismia guineensis	1								
Vitex micrantha	1		2						YES
Unknown						2	2	1	
Total	31	44	40	12	8	26	43	43	

Figure 2. Watering the plantation trees with an engine-driven pump.

1 and 2, respectively (Table 1). A total of 18 plant species were identified, and five plants were categorized as unknown. Seven species grew in both transects. Of the 18 species, 11 were included on the plant food list of the Bossou chimpanzees (Matsuzawa *et al*. 2011). We categorized the plant heights into the following four classes: <50, 50–100, 100–150, and 150–200 cm. The number of saplings between the two transects was significantly different for each height class except for 100–150 cm (Mann-Whitney *U*-test, $U = 761.0$, $Z = 0.93$, $p = 0.35$). In transect 1, the less recently cut area, the numbers of plants were larger than in transect 2 for the <50 and 50–100 cm classes (<50 cm class: *U*-test, $U = 22.0$, $Z = 3.95$, $p < 0.01$; 50–100 cm class: $U = 167.5$, $Z = 5.04$, $p < 0.01$). In contrast, the number of plants in transect 1 was smaller than that in transect 2 for the 150–200 cm class ($U = 126.0$, $Z = 2.74$, $p < 0.01$). Thus, transect 1 was more enriched with small natural saplings compared to transect 2.

The findings of the vegetation surveys indicated that grass cutting was effective for enhancing the growth of natural saplings, because (1) few different plant species can survive naturally in the bush, (2) new natural saplings can emerge after mowing, and (3) the natural plant species in the transects mostly consisted of various food plants of the Bossou chimpanzees. A number of new natural saplings in transect 1 compared to transect 2 can be expected to become a possible food resources of fruing trees for wild chimpanzees in the future, while most of them were too young to produce fruits at the moment. Therefore, the combination of arbor sapling plantation and grass cutting around the plants was effective, not only for improving the working efficiency of the labor force and reducing financial costs, but also for practicing reforestation by providing natural food and space resources for wild chimpanzees. Further studies on the survival of saplings at different height classes are necessary, as the present survey observed fewer tall natural saplings in transect 1 than in transect 2.

We plan to plant 20,000 saplings of *Uapaca heudelotii* in the area of the two transects in 2015. This planting is expected to illustrate the effectiveness of our combined procedure by creating plantation strips greater than 1 km in length. Additionally, in 2014, we started a pilot study on watering the grass-cutting area during the dry season with an engine-driven water pump (Figure 2). Our empirically grounded techniques for plantations have substantially accelerated the progress of the Green Corridor project. Unfortunately, an epidemic of Ebola virus disease (EVD) is ongoing in Guinea, Liberia, Sierra Leone, and other countries (Butler & Morello 2014). Two patients with EVD were confirmed in Lola, a town located approximately 18 km from Bossou, in September 2014. Despite these circumstances, all local collaborators that have worked for the Green Corridor project remain in good health.

ACKNOWLEDGMENTS

This work was financially supported by grants from the Toyota Environmental Activities Grant Program by the Toyota Motor Corporation (G2013-036), MEXT KAKENHI (#24000001), and the JSPS Core-to-Core Program, A. Advanced Research Networks to Tetsuro Matsuzawa. Thanks are also due to the Guinean authorities, Dr. Aly Gaspard Soumah from the Institut de Recherche Environnementale de Bossou, and Dr. Mohamed Salou Diane from the Direction Nationale de la Recherche Scientifique et Technologique. We thank our coworkers, including Bouna Zogbila, Remy Touré, Diri Bamba, Boniface Zogbila, Jiles Doré, Henry Camara, Gouanou Zogbila, Vincent Traoré, and Lawé Goweibé, for their support of the project. We are also grateful for Drs. Yukimaru Sugiyama and Gen Yamakoshi, who contributed to this project during various stages.

REFERENCES

Butler D, Morello L 2014. Ebola by the numbers: The size, spread and cost of an outbreak. *Nature* **514**:284–285.

Hirata S, Morimura N, Matsuzawa T 1998. Green passage plan (tree-planting project) and environmental education using documentary videos at Bossou: a progress report. *Pan Afr News* **5**:18–20.

Matsuzawa T 2007. Assessment of the planted trees in Green Corridor Project. *Pan Afr News* **14**:27–29.

Matsuzawa T, Humle T, Koops K, Biro D, Hayashi M, Sousa C, Mizuno Y, Kato A, Yamakoshi G, Ohashi G, Sugiyama Y, Kourouma M 2004. Wild chimpanzees at Bossou-Nimba: deaths through a flu-like epidemic in 2003 and the green-corridor project. *Primate Res* **20**:45–55, in Japanese with English summary.

Matsuzawa T, Humle T, Sugiyama Y 2011. *The Chimpanzees of Bossou and Nimba*. Springer Verlag, Tokyo.

Morimura N, Ohashi G, Soumah G, Matsuzawa T 2011. Bush fire control using arbors in green corridor project at Bossou. *Pan Afr News* **18**:10–11.

Ohashi G, Hasegawa R, Kourouma M, Matsuzawa T 2008. Arbors and cuttings: new trials for green corridor project at Bossou-Nimba. *Pan Afr News* **15**:20–23.

Pan Africa News, Vol. 21, No. 2
Published in December, 2014
Address: c/o Human Evolution Studies,
Dept. of Zoology, Faculty of Science,
Kyoto Univ., Kyoto, 606-8502, JAPAN
TEL: (+81)75-753-4093
FAX: (+81)75-753-4115
E-mail: pan.editor@gmail.com
URL: http://mahale.main.jp/PAN/
ISSN: 1884-751X (Print), 1884-7528 (Online)